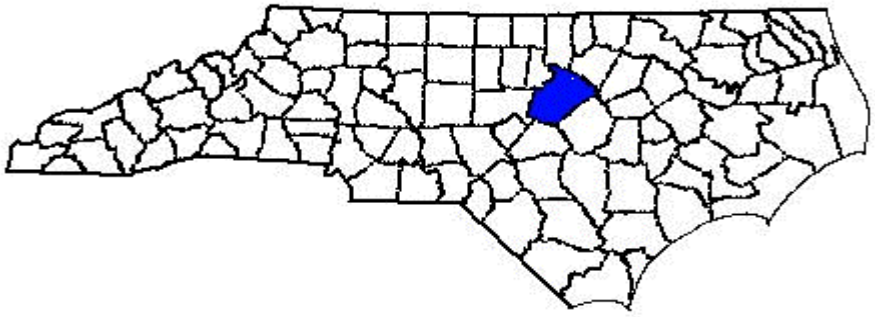
ANNUAL REPORT FOR 2003



New Light Creek Mitigation Site
Wake County
Project No. 8.U401721
TIP No. R-2000 WM

Prepared By:
Office of Natural Environment & Roadside Environmental Unit
North Carolina Department of Transportation
December 2003

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

APPENDICES

SUMMARY

The following report summarizes the monitoring activities that have occurred in the past year at the New Light Creek Mitigation Site. This site was originally constructed in 1998. Monitoring activities in 2003 represent the fifth year of monitoring for the site. The site must demonstrate both hydrologic and vegetation success for a minimum of five years or until the site is deemed successful.

In 2002, four additional monitoring gauges were installed, based on agency comments and review. Currently, the site hydrology is monitored with ten groundwater gauges and an onsite rain gauge.

This report utilizes rainfall data from both a local weather station and from an onsite rain gauge. The NC State Climate Office provided the historical data for the Raleigh/Durham weather station.

For the 2003-year, hydrologic monitoring indicated that four of the ten monitoring gauges (GW-1, GW-2, GW-3, and GW-5) met the optimum saturation (within 12" of the surface for more than 12.5% of the growing season).

There were four vegetation plots established to monitor the 13.2 acres planted in trees on the site. The fifth year of monitoring revealed an average density of 548 trees per acre, which is well above the minimum required by the success criteria.

A wetland delineation was performed in December 2003 to determine the extent of restored wetlands on the New Light Creek Mitigation Site. The delineation was conducted by the continual sampling of hydric and non-hydric soils until the edges of the wetland units were identified. Previous years hydrology data was used to refine the delineation. Mictrotopography, landscape position, soil textural changes, redoximorphic features, and the presence of a depleted matrix were also considered to determine the extent of hydric soils in transitioning areas. Wetland data sheets and soil profile descriptions (Appendix D) were prepared to support the differentiation between wetland and non-wetland areas.

Representatives from NCDOT-ONE met onsite with a representative from the USACOE to get jurisdictional concurrence of the delineated boundary in December 2003. Global Positioning Satellite (GPS) technology was used to survey the flagged boundaries. A boundary map was prepared and is included herein (Appendix D).

The 2003-year represents the fifth year that the site has been monitored for hydrology and vegetation. A wetland delineation was conducted in December 2003 to determine the extent of restored wetlands. Following concurrence of the delineated boundary, a total of 6.83 acres of wetlands were mapped on the New Light Creek Mitigation Site.

NCDOT has approached the EEP (Ecosystem Enhancement Program) about accepting the 5.44-acre deficit from the New Light Creek Mitigation Site. The resource agencies will be contacted as soon as more information is available. With this determination, NCDOT proposes to discontinue monitoring activities on this site.

1.0 INTRODUCTION

1.1 PROJECT DESCRIPTION

The New Light Creek Mitigation Site is located east of Mangum Dairy Road (SR 1911) adjacent to New Light Creek in Wake County, near the Granville County Line (Figure 1). This site was constructed to provide mitigation for wetland impacts associated with the Raleigh Outer Loop (R-2000).

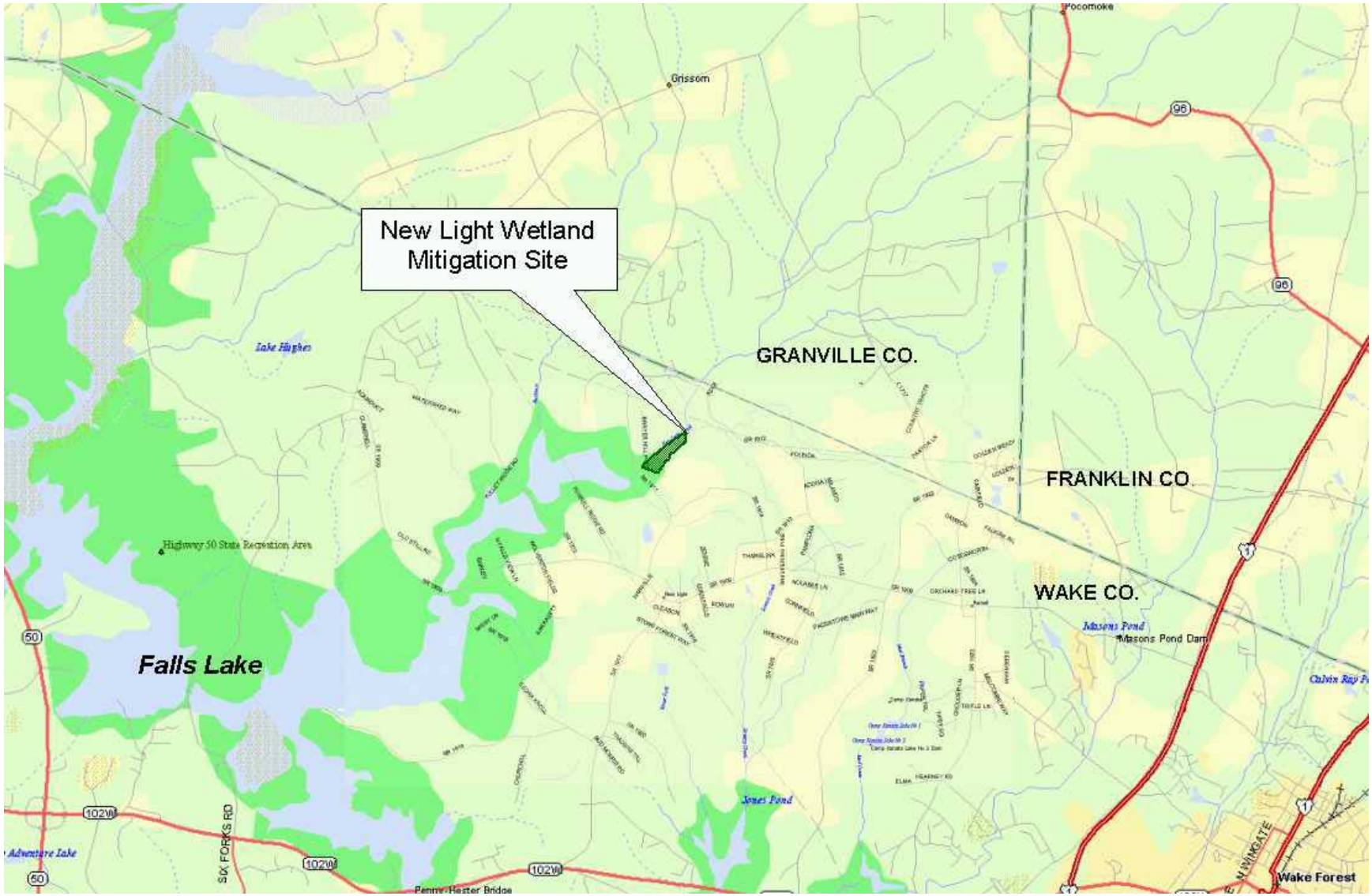
The site, which totals 19.8 acres in size, consists of bottomland hardwood forest restoration and creation. The site was constructed in 1998 and planted in 1999.

1.2 PURPOSE

In order to demonstrate successful mitigation, hydrologic and vegetative monitoring must be conducted for a minimum of five consecutive years or until the site is deemed successful. Success criteria are based on federal guidelines for wetland mitigation. These guidelines stipulate criteria for both hydrologic conditions and vegetation survival. The following report details the results of hydrologic and vegetative monitoring during the 2003 growing season at the New Light Creek Mitigation Site.

Activities in 2003 reflect the fifth year of monitoring following the restoration efforts. Included in this report are analyses of both hydrologic and vegetative monitoring results, as well as local climate conditions throughout the growing season and site photographs.

Figure 1. Site Location Map



1.3 PROJECT HISTORY

October 1998	Site Grading Commenced
February 1999	Site Planted
March 1999	Monitoring Gauges Installed
March- November 1999	Hydrologic Monitoring (1 yr.)
September 1999	Vegetation Monitoring (1 yr.)
March- November 2000	Hydrologic Monitoring (2 yr.)
November 2000	Vegetation Monitoring (2 yr.)
March- November 2001	Hydrologic Monitoring (3 yr.)
July 2001	Vegetation Monitoring (3 yr.)
March 2002	Supplemental Planting of Streambank Levee
March- November 2002	Hydrologic Monitoring (4 yr.)
June 2002	Vegetation Monitoring (4 yr.)
March- November 2003	Hydrologic Monitoring (5 yr.)
June 2003	Vegetation Monitoring (5 yr.)
December 2003	Wetland Delineation

1.4 DEBIT LEDGER

The entire New Light Creek Mitigation Site was used for projects R-2000EA and R-2000EB to compensate for unavoidable wetland impacts.

2.0 HYDROLOGY

2.1 SUCCESS CRITERIA

In accordance with federal guidelines for wetland mitigation, the success criteria for hydrology state that the area must be inundated or saturated (within 12" of the surface) by surface or groundwater for at least a consecutive 12.5% of the growing season. Areas inundated for less than 5% of the growing season are always classified as non-wetlands. Areas inundated between 5% - 12.5% of the growing season can be classified as wetlands depending upon factors such as the presence of wetland vegetation and hydric soils.

The growing season in Wake County begins March 26 and ends November 10. These dates correspond to a 50% probability that temperatures will drop to 28°F or lower after March 26 and before November 10.[1] The growing season is 229 days; therefore, optimum hydrology requires 12.5% of this season, or at least 29 consecutive days. Local climate must also represent average conditions for the area.

2.2 HYDROLOGIC DESCRIPTION

In March of 1999, six groundwater-monitoring gauges were installed across the site (Figure 2). Four additional groundwater-monitoring gauges were installed in February 2002. The automatic monitoring gauges record daily readings of groundwater depth.

The New Light Creek Site was designed to receive hydrologic input from rainfall. The hydrologic monitoring should show the reaction of the groundwater level to specific rainfall events.

[1] Natural Resources Conservation Service, Soil Survey of Wake County, North Carolina.

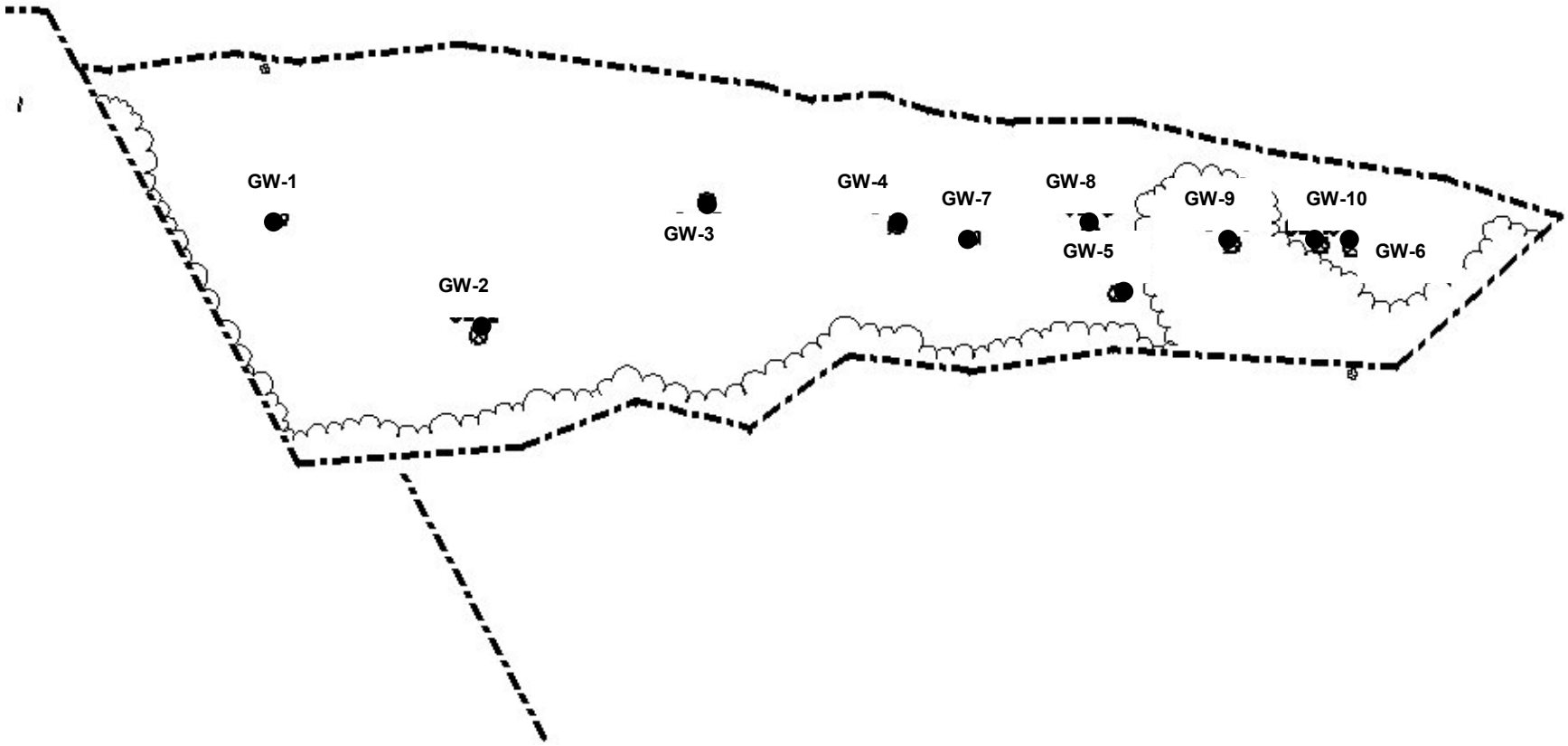


Figure 2. Monitoring Gauge Location Map

2.3 RESULTS OF HYDROLOGIC MONITORING

2.3.1 Site Data

The maximum number of consecutive days that the groundwater was within twelve inches of the surface was determined for each gauge. This number was converted into a percentage of the 229-day growing season (March 26 – November 10). The results are presented in Table 1.

Appendix A contains a plot of the groundwater depth for each monitoring gauge during 2003. The maximum number of consecutive days is noted on each graph. The individual precipitation events, shown on the monitoring well graphs as bars, represent data collected from the onsite Infinity rain gauge

In February 2002, four new ground water gauges (GW-7, GW-8, GW-9, GW-10) were installed. These gauges were installed between existing gauges that were either not meeting success or were marginal, with respect to the success criteria, based on previous years monitoring (Table2).

Figure 3 provides a graphical representation of the hydrologic results. Gauges highlighted in blue indicate wetland hydrology for more than 12.5% of the growing season. Gauges highlighted in red indicate saturation between 8 and 12.5% of the growing season, while those in green indicate saturation between 5 and 8%. Gauges highlighted in black indicate no wetland hydrology (less than 5% of the growing season).

Table 1. 2003 New Light Creek Hydrologic Monitoring Results

Monitoring Gauge	< 5%	5-8%	8-12.5%	>12.5%	Actual %	Success Dates
GW-1+				×	30.9	July 12-Aug 29 Sept 1-Nov 10
GW-2+				×	79.6	March 26-Sept 24
GW-3+				×	100	March 26-Nov 10
GW-4	×				4.3	
GW-5+				×	100	March 26-Nov 10
GW-6	×				4.8	
GW-7		×			5.2	April 8-April 19
GW-8			×		12.2	March 26-April 22
GW-9			×		8.7	Aug 2-Aug 21
GW-10	×				2.6	

+ Gauge met success criterion during an average rainfall month (March, July, and October).

Table 2. Hydrologic Monitoring Results (1999- 2002)

Monitoring Gauge	1999 Results Pre Hurricane	1999 Results Post Hurricane	2000 Results	2001 Results	2002 Results
GW-1	2.2	27.8	10.9	7.0	13.1
GW-2	11.3	33.4	100	50.2	30.6
GW-3	12.6	29.1	18.3	17.9	13.5
GW-4	1.3	4.3	7.0	4.4	4.4
GW-5	3.9	29.1	100	43.2	23.1
GW-6	2.2	3.9	3.0	3.1	3.1
GW-7	Not Installed	Not Installed	Not Installed	Not Installed	1.8
GW-8	Not Installed	Not Installed	Not Installed	Not Installed	5.7
GW-9	Not Installed	Not Installed	Not Installed	Not Installed	3.1
GW-10	Not Installed	Not Installed	Not Installed	Not Installed	1.3
Climate Conditions	Below Average Rainfall	Above Average Rainfall	Average Rainfall	Below Average Rainfall	Below Average Rainfall

Table 2 represents hydrologic data in percentages from previous years (1999-2002).

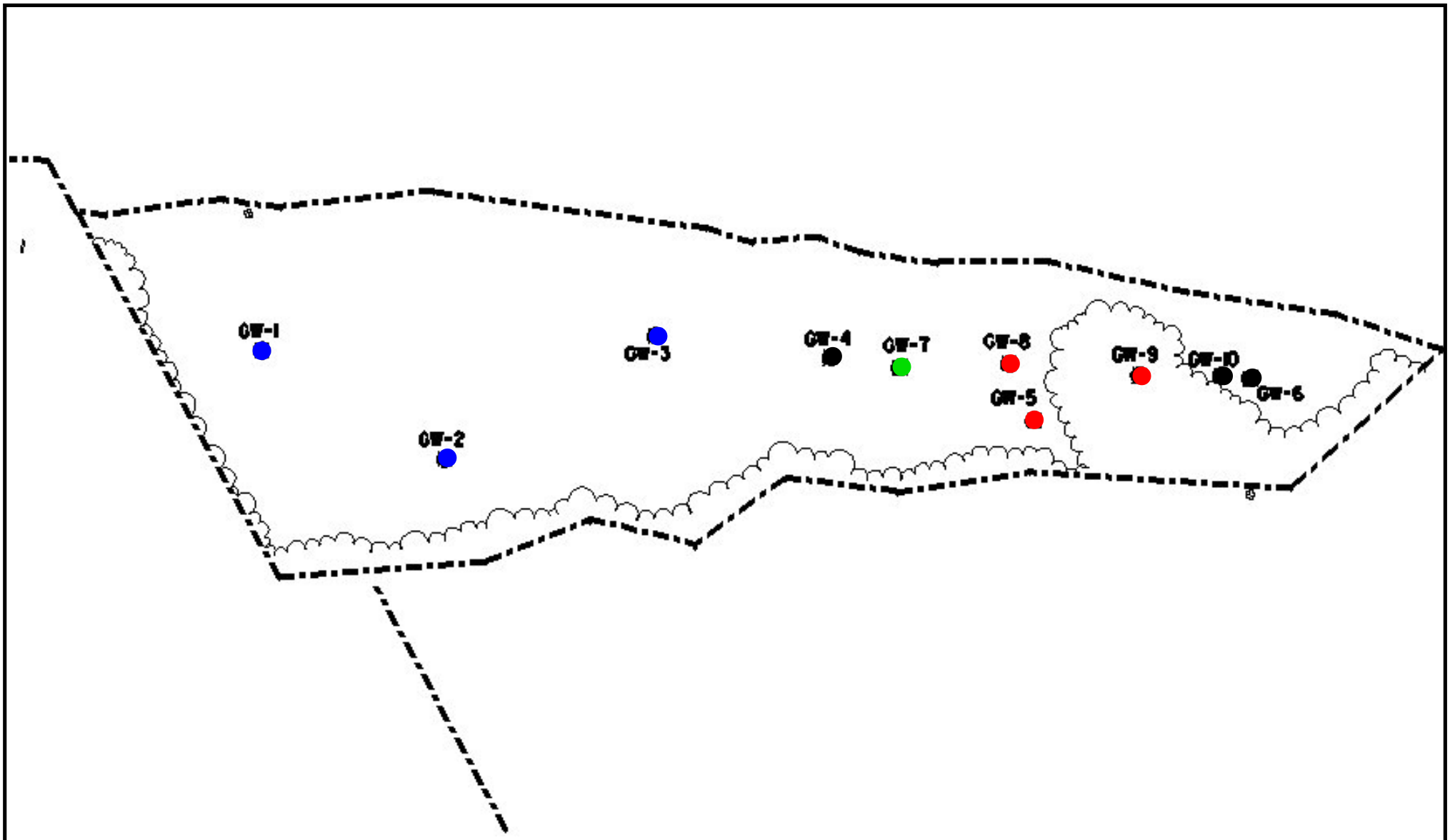


Figure 3. 2003 Hydrologic Monitoring Gauge Results

Hydrology Results

- < 5%
- 5 - 8%
- 8 - 12.5%
- > 12.5%

Rain Gauge

Surface Gauge

N

Not to Scale

2.3.2 Climatic Data

Figure 4 represents an evaluation of the local climate in comparison with historical data in order to determine whether 2003 was “average” in terms of climate conditions. The two lines represent the 30th and 70th percentiles of monthly precipitation for Raleigh. The bars are the monthly rainfall totals for November 2002 through November 2003. The NC State Climate Office provided the historical data.

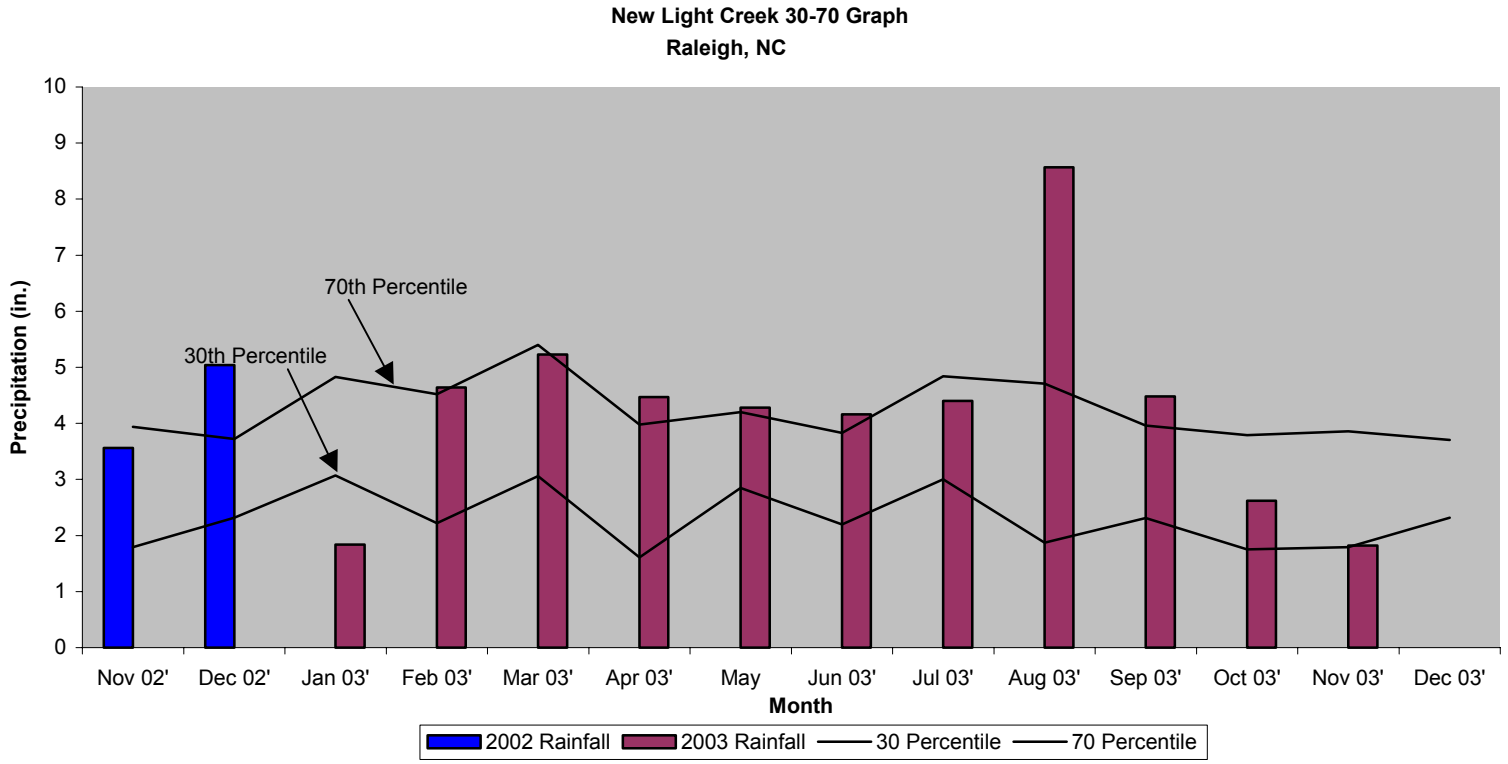
Months with below average rainfall include January and November. November (02’), February, March, July, and October experienced average rainfall. The months of December (02’), April, May, June, August, and September all experienced above average rainfall for the year. Overall, the site experienced average to above average rainfall in 2003.

2.4 CONCLUSIONS

The 2003-year represents the fifth full growing season that hydrologic data has been examined. For the 2003-year, hydrologic monitoring indicated that four of the ten monitoring gauges (GW-1, GW-2, GW-3, and GW-5) met the optimum saturation (within 12” of the surface for more than 12.5% of the growing season).

NCDOT has approached the EEP (Ecosystem Enhancement Program) about accepting the 5.44-acre deficit from the New Light Creek Mitigation Site. The resource agencies will be contacted as soon as more information is available. With this determination, NCDOT proposes to discontinue monitoring activities on this site.

Figure 3. 30-70 Percentile Graph



3.0 VEGETATION: NEW LIGHT CREEK MITIGATION SITE (YEAR 5 MONITORING)

3.1 SUCCESS CRITERIA

NCDOT will monitor the site for five years or until success criteria are met. A 320 stems per acre survival criterion for planted seedlings will be used to determine success for the first three years. The required survival criterion will decrease by 10% per year after the third year of vegetation monitoring (i.e., for an expected 290 stems per acre for year 4 and 260 stems per acre for year 5). The number of plants of one species will not exceed 20% of the total number of planted trees.

3.2 DESCRIPTION OF SPECIES

The following species were planted in the Wetland Enhancement/Preservation Area:

Bottomland Hardwood Area (12.2 Acres)

Quercus phellos, Willow Oak
Quercus falcata var. *pagodaefolia*, Cherrybark Oak
Fraxinus pennsylvanica, Green Ash
Nyssa sylvatica var. *sylvatica*, Blackgum
Quercus lyrata, Overcup Oak
Quercus michauxii, Swamp Chestnut Oak

Levee Area (1.0 Acre)

Betula nigra, River Birch
Quercus lyrata, Overcup Oak
Quercus phellos, Willow Oak
Platanus occidentalis, Sycamore
Juglans nigra, Black Walnut

3.3 RESULTS OF VEGETATION MONITORING

Table 3. Vegetation Monitoring Statistics

Plot # (Type)	Blackgum	Cherrybark Oak	Green Ash	Overcup Oak	Swp. Chestnut Oak	Willow Oak	Black Walnut	Total (5 year)	Total (at planting)	Density (Trees/Acre)
1 (B L H /L e v e e)	1	1		3	1 0	6	9	3 0	3 7	5 5 1
2 (B L H)		5	3	1 5	5	5		3 3	3 8	5 9 1
3 (B L H)	2	8	1 1	2				2 3	3 4	4 6 0
4 (B L H)	2	2	5	6	1 5	2		3 2	3 7	5 8 8
					A V E R A G E D E N S I T Y					**5 4 8**

Site Notes: Volunteer green ash and sycamore were found throughout the site. Heavy grasses and ground cover exist throughout the site including fescue, smartweed, horse-nettle, *Juncus* sp., poison ivy, pokeweed, stinkweed, and small pines.

The swale in the middle of the site with a slightly lower elevation contains various wetland species including *Juncus* sp., *Scirpus* sp., *Cyperus* sp., black willow, and cattail. Standing water is present throughout this middle swale. This swale was established during construction of the site and is described and shown in the attached map taken from the June 1998 mitigation plan.

3.4 CONCLUSIONS

Of the 19.8 total acres on this site, approximately 13.2 acres involved tree planting. There were 4 vegetation-monitoring plots established throughout the site. The 2003 vegetation monitoring of the site revealed an average density of 548 trees per acre, which is well above the minimum required by the success criteria.

NCDOT and USACE personnel inspected the washout along the streambank in June 2000. It was agreed that NCDOT would repair the washout. This work was not done. A site inspection in September 2000 revealed this washout to be stabilizing on its own. NCDOT has continued to monitor this area to determine if this slope will stabilize given time. The streambank was inspected and photographed during the 2003-monitoring visit and no other signs of erosion were observed (see photos 5 and 6).

In 2002, NCDOT performed supplemental planting of the streambank levee due to the beaver damage to existing trees. The following species were planted: sycamore, cherrybark oak, and water oak.

NCDOT proposes to discontinue vegetation monitoring on the New Light Creek Mitigation Site.

4.0 OVERALL CONCLUSIONS

In 2003, hydrologic monitoring indicated that four of the ten monitoring gauges (GW-1, GW-2, GW-3, and GW-5) met the optimum saturation (within 12" of the surface for more than 12.5% of the growing season). The four vegetation-monitoring plots indicate an average density of 548 trees per acre.

The 2003-year, represents the fifth year that the site has been monitored for hydrology and vegetation. A wetland delineation was conducted in December 2003 to determine the extent of restored wetlands. Following concurrence of the delineated boundary, a total of 6.83 acres of wetlands were mapped on the New Light Creek Mitigation Site.

NCDOT has approached the EEP (Ecosystem Enhancement Program) about accepting the 5.44-acre deficit from the New Light Creek Mitigation Site. The resource agencies will be contacted as soon as more information is available. With this determination, NCDOT proposes to discontinue monitoring activities on this site.

APPENDIX A

GAUGE DATA GRAPHS

APPENDIX B

SITE PHOTOS & VEGETATION PLOT LOCATIONS

New Light Creek

Photo 1

Photo 2

Photo 3

Photo 4

Photo 5

Photo 6

2003

New Light Creek

Photo 7

Photo 8

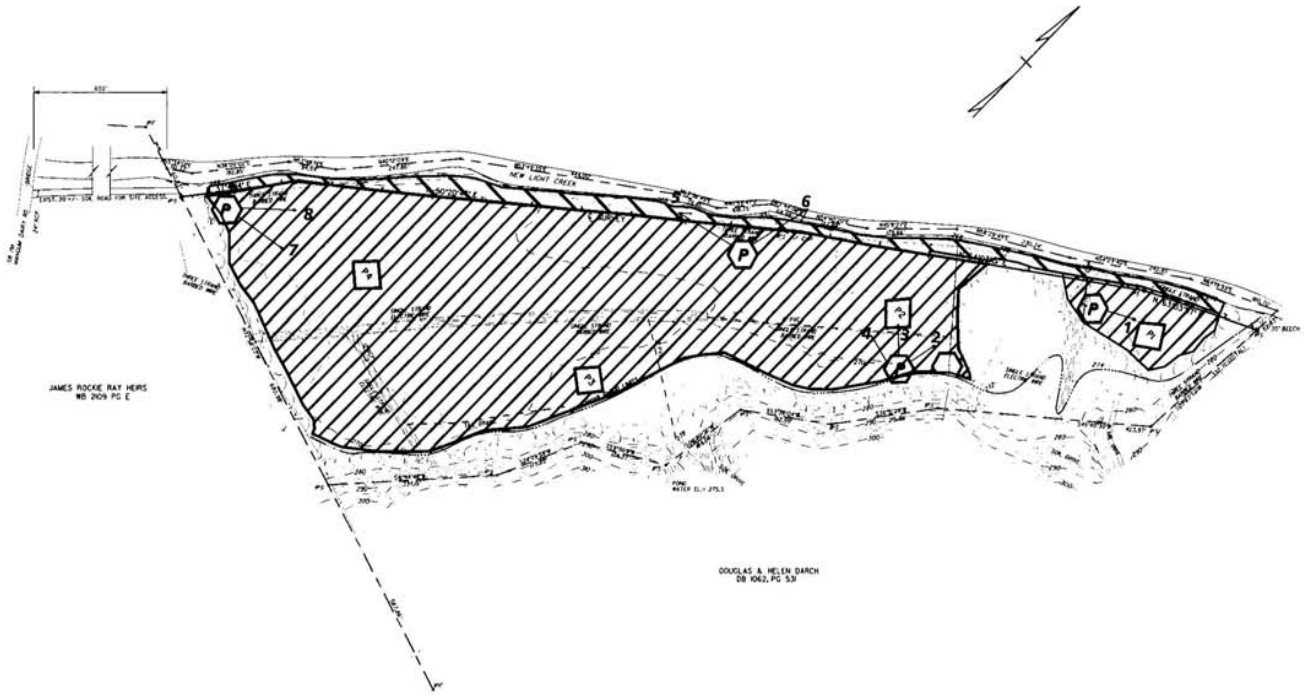
2003

NEW LIGHT CREEK MITIGATION SITE
VEGETATIVE PLOT AND PHOTO POINT LOCATIONS

R:2000WM

50 0 100
SCALE 1" = 100'

REVISIONS



P PHOTO POINTS

VEGETATION MONITORING PLOTS

Bottomland Hardwood Area

Levee Area

APPENDIX C

EXCERPT FROM 1998 MITIGATION PLAN

Filling of the central ditch and removal of the drain tiles will be performed in September and October while the site is relatively dry. Five groundwater monitor wells will be installed across the site to monitor site hydrology and assist with final design. Observed water elevations during November and December will be used to help evaluate whether the proper hydrology has been restored, prior to planting of the hardwood seedlings in January and February.

4.2 TOPOGRAPHIC MODIFICATION

Prior to conversion to pasture, a number of swales/depressions were present across the site. Minor grading is proposed to reestablish microtopographic relief across the site and establish several swales or depressions to help retain surface water on the site. The general configuration of these proposed swales are shown on Figure 6. The swales will be 6 to 18 m (20 to 50 ft) wide and 30 to 90 m (100 to 300 ft) long. The middle of the swale will be about 15 to 30 cm (0.5 to 1.0 ft) below the elevation of the swale edge. Small deeper 30 cm (1.0 ft) depressions will be constructed in the downstream end of several of the swales to provide an area that experiences temporary ponding and a diverse habitat.

The location, shape, and elevations of the swales was based on the depressions within a bottomland forest area located about one-half mile south of the mitigation site. This wetland area is located on similar soils and a similar landscaped position as the mitigation site. The location of this wetland is shown on Figure 6. The general shape and dimensions of these depressions were measured using a transit and level and 100-foot tape measure. In general the swales in this area were roughly parallel to the stream irregular in shape but tending towards long and narrow. Measurements in this reference area indicated that the maximum elevation differences between the tops of hummocks and the bottom of swales is 1 foot. The average difference in elevation was 0.47 feet. The swales varied in width from 4 feet to 26 feet, and in length from 30 feet to over 300 feet.

In addition, some soil and tree trunks have been placed along the tops of the banks of New Light Creek to help reduce overtopping of the banks. This material will be removed to allow natural over banking to occur.

It is anticipated that initial site grading and removal of all tile, ditches, and pipes will occur in September of 1998. During late fall/early winter, and prior to planting, elevations of the swales and other site features may be modified. Modification will be based upon observed conditions such as water levels in on-site monitor wells and observed surface water condition.

Excerpt from June 1998 Mitigation Plan

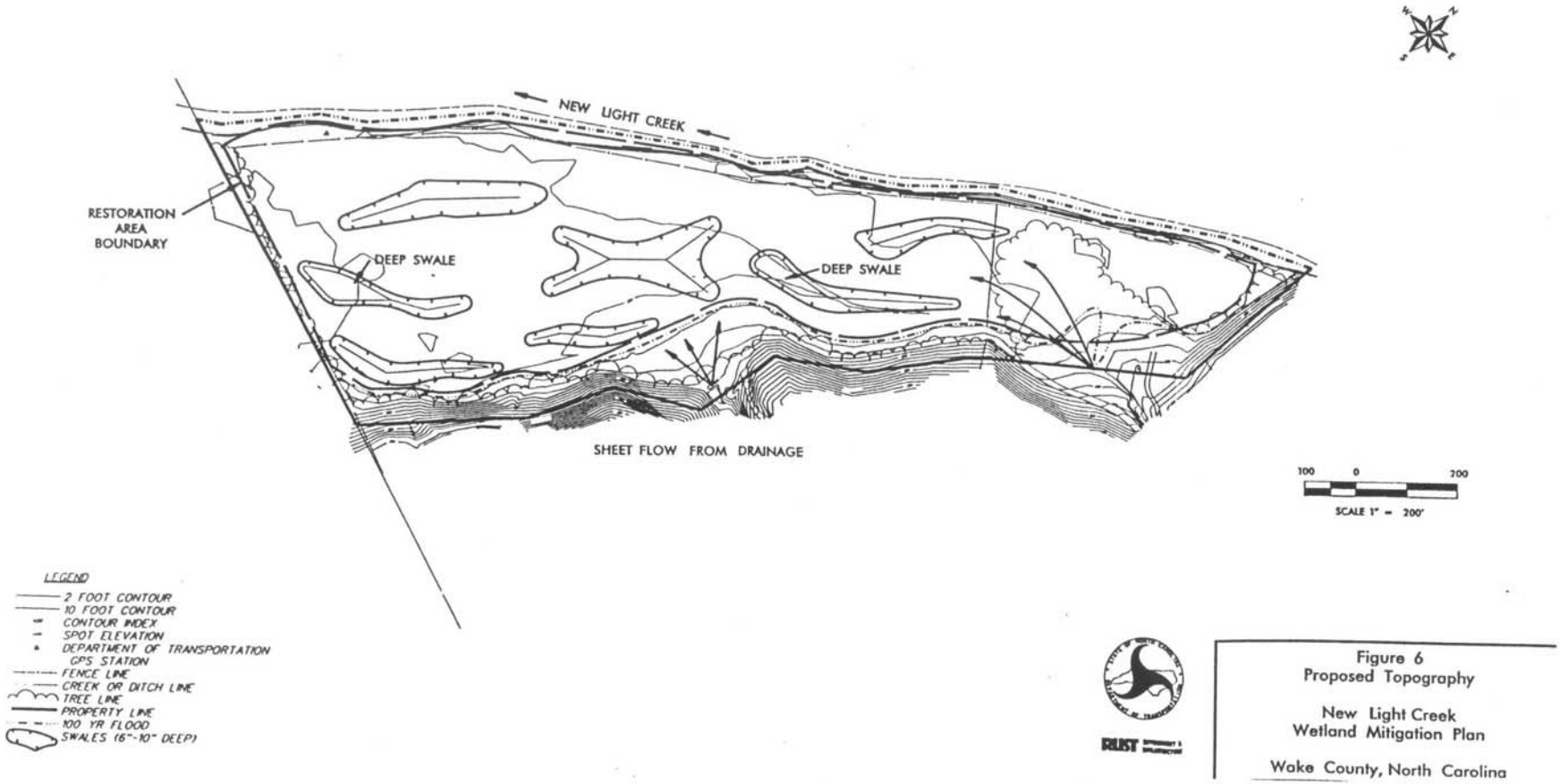


Figure 6
Proposed Topography

New Light Creek
Wetland Mitigation Plan

Wake County, North Carolina

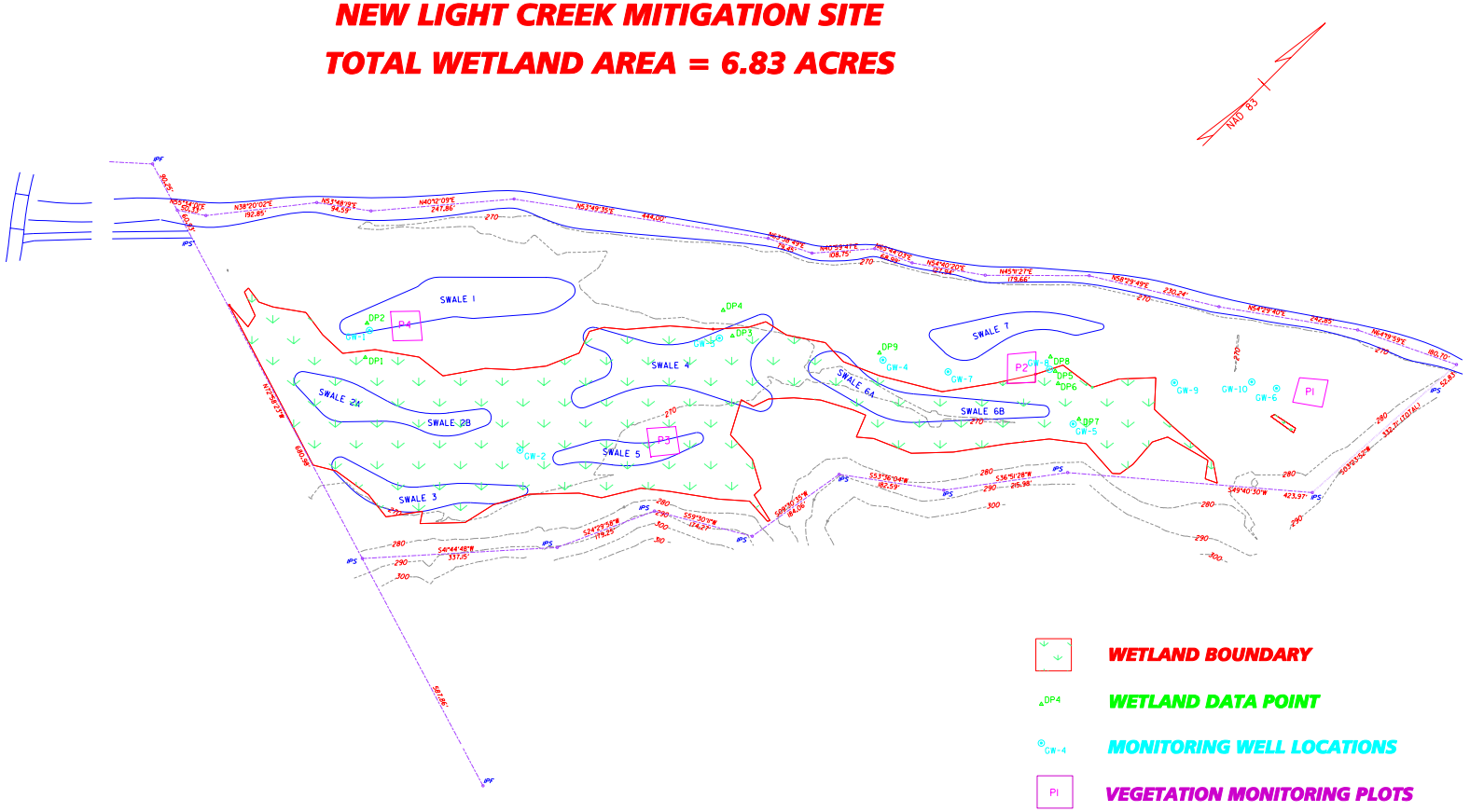
APPENDIX D

WETLAND DELINEATION

50 0 100 SCALE 1" = 100'	PROJ. REFERENCE NO. R-2000WM	SHEET NO.
REVISIONS:	HIGHWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
	Prepared in the Office of:	

NEW LIGHT CREEK MITIGATION SITE

TOTAL WETLAND AREA = 6.83 ACRES



DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project Site:	New Light Creek Wetland Mitigation Site			Date:	12/03/03
Applicant/Owner:	NCDOT			County:	Wake
Investigator:	S. Stokes, M. Schlegel			State:	NC
Do Normal Circumstances exist on the site?		**Yes**	No	Community ID:	
Is the site significantly disturbed (Atypical Situation)?		Yes	**No**	Transect ID:	
Is there area a potential Problem Area? (if needed, explain on reverse.)		Yes	**No**	Plot ID:	Data Point 1 (wetland)

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1.	*Fraxinus pennsylvanica*	2	FACW	9.			
2.	*Acer negundo*	2	FACW	10.			
3.	*Quercus phellos*	2	FACW-	11.			
4.	*Acer rubrum*	2	FAC	12.			
5.	*Fraxinus pennsylvanica*	3	FACW	13.			
6.	*Juncus effusus*	3	FACW+	14.			
7.	*Boehmeria cylindrica*	3	FACW+	15.			
8.	*Polygonum spp.*	3	-	16.			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 100 %

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ___ Stream, Lake or Tide Gauge
- ___ Aerial Photographs
- ___ Other

_X_ No Recorded Data Available

Field Observations: _____ (in.)

Depth of Surface Water _____ (in.)

Depth to Free Water in Pit: 11.5 (in.)

Depth to Saturated Soil: 11 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- _____ Inundated
- _____ Saturated in Upper 12 Inches
- _____ Water Marks
- _____ Drift Lines
- _____ Sediment Deposits
- _____ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- _X_ Oxidized Root Channels in Upper Inches
- _____ Water-Stained Leaves
- _____ Local Soil Survey Data
- _X_ FAC-Neutral Test
- _____ Other (Explain in Remarks)

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

SOILS

Map Unit Name (Series and Phase): Wehadkee variant

Drainage Class: Poorly Drained

Taxonomy (Subgroup): Fluvaquentic Endoaquepts

Field Observations Confirm Mapped Type? **Yes** No

Profile Description:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-4	A	10YR 5/3			l, 1fgr
4-8	Bw	10YR 5/3	10YR 5/2	f1f	scl, 1msbk
			4/5b	c2p	
8-11	Bg1	10YR 5/2	10YR 4/4	f1f	scl, 1msbk
			5YR 4/6	f1f	
11-16	Bg2	10YR 5/2	5YR 4/6	c2p	scl, 1fsbk

Hydric Soil Indicators:

_____ Histosol	_____ Concretions
_____ Histic Epipedon	_____ High Organic Content in Surface Layer in Sandy Soils
_____ Sulfidic Ordor	_____ Organic Streaking in Sandy Soils
__X__ Aquic Moisture Regime	__X__ Listed on Local Hydric Soils List
_____ Reducing Conditions	__X__ Listed on National Hydric Soils List
__X__ Gleyed or Low-Chroma Colors	__X__ Other (Explain in Remarks)

Remarks:
Gley mottles in 4-8” horizon indicate that the soils are episaturated and transitioning to a wetter soil;
redox concentrations are present in the 8-11” horizon;
oxidized root channels are present in the 11-16” horizon.

WETLAND DETERMINATION

Hydrophytic Vegetation Present	**Yes**	No (circle)	(circle)	
Wetland Hydrology Present?	**Yes**	No		
Hydric Soils Present?	**Yes**	No	Is this Sampling Point Within a Wetland?	**Yes** No

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project Site:	New Light Creek Wetland Mitigation Site			Date:	12/03/03
Applicant/Owner:	NCDOT			County:	Wake
Investigator:	S. Stokes, M. Schlegel			State:	NC
Do Normal Circumstances exist on the site?		**Yes**	No	Community ID:	
Is the site significantly disturbed (Atypical Situation)?		Yes	**No**	Transect ID:	
Is there area a potential Problem Area? (if needed, explain on reverse.)		Yes	**No**	Plot ID:	Data Point 2 (nonwetland)

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1.	*Quercus falcata*	2	FAC+	9.			
2.	*Liquidambar styraciflua*	2	FAC+	10.			
3.	*Pinus taeda*	2	FAC	11.			
4.	*Acer rubrum*	2	FAC	12.			
5.	*Juncus effusus*	3	FACW+	13.			
6.	*Festuca spp.*	3	FAC-	14.			
7.				15.			
8.				16.			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 83 %

Remarks:

HYDROLOGY

_X_ Recorded Data (Describe in Remarks):
___ Stream, Lake or Tide Gauge
___ Aerial Photographs
_X_ Other
___ No Recorded Data Available

Field Observations: _____ (in.)

Depth of Surface Water _____ (in.)

Depth to Free Water in Pit: 16 (in.)

Depth to Saturated Soil: 16 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
_____ Inundated
_____ Saturated in Upper 12 Inches
_____ Water Marks
_____ Drift Lines
_____ Sediment Deposits
_____ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
_____ Oxidized Root Channels in Upper Inches
_____ Water-Stained Leaves
_____ Local Soil Survey Data
_X_ FAC-Neutral Test
_____ Other (Explain in Remarks)

Remarks:
Adjacent to monitoring well #1

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

SOILS

Map Unit Name (Series and Phase): Chewacla

Drainage Class: Somewhat Poorly

Taxonomy (Subgroup): Fluvaquentic Dystrudepts

Field Observations Confirm Mapped Type? **Yes** No

Profile Description:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-9.5	A	10YR 4/3			sl, 1mgr
9.5-12.5	Bw1	10YR 4/3	5YR 4/6	c2p	scl, 1fsbk
12.5-14	Bw2	10YR 4/3	5YR 4/6	c2p	scl, 1msbk
			10YR 5/2	c2f	
14-32	Bw3	10YR 5/2	5YR 4/6	c2p	sl, 1fsbk

Hydric Soil Indicators:

_____ Histosol
_____ Histic Epipedon
_____ Sulfidic Ordor
_____ Aquic Moisture Regime
_____ Reducing Conditions
_____ Gleyed or Low-Chroma Colors
_____ Concretions
_____ High Organic Content in Surface Layer in Sandy Soils
_____ Organic Streaking in Sandy Soils
__X__ Listed on Local Hydric Soils List
__X__ Listed on National Hydric Soils List
_____ Other (Explain in Remarks)

Remarks:
Water table is at 16";
listed on local hydric soils list as having inclusions of hydric soils;
listed on National hydric soils list as frequently flooded.

WETLAND DETERMINATION

Hydrophytic Vegetation Present	**Yes**	No (circle)		(circle)
Wetland Hydrology Present?	Yes	**No**		
Hydric Soils Present?	Yes	**No**	Is this Sampling Point Within a Wetland?	Yes **No**

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project Site:	New Light Creek Wetland Mitigation Site			Date:	12/15/03
Applicant/Owner:	NCDOT			County:	Wake
Investigator:	S. Stokes, M. Schlegel			State:	NC
Do Normal Circumstances exist on the site?		**Yes**	No	Community ID:	
Is the site significantly disturbed (Atypical Situation)?		Yes	**No**	Transect ID:	
Is there area a potential Problem Area? (if needed, explain on reverse.)		Yes	**No**	Plot ID:	Data Point 3 (wetland)

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1.	*Acer negundo*	2	FACW	9.			
2.	*Quercus michauxii*	2	FACW-	10.			
3.	*Fraxinus pennsylvanica*	2	FACW	11.			
4.	*Festuca spp.*	3	FAC-	12.			
5.				13.			
6.				14.			
7.				15.			
8.				16.			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 75 %

Remarks:

HYDROLOGY

_X_ Recorded Data (Describe in Remarks):
___ Stream, Lake or Tide Gauge
___ Aerial Photographs
_X_ Other
___ No Recorded Data Available

Field Observations: _____ (in.)

Depth of Surface Water _____ (in.)

Depth to Free Water in Pit: 10 (in.)

Depth to Saturated Soil: _____ (in.)

Wetland Hydrology Indicators:

Primary Indicators:
_____ Inundated
_____ Saturated in Upper 12 Inches
_____ Water Marks
_____ Drift Lines
_____ Sediment Deposits
_____ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
_X_ Oxidized Root Channels in Upper Inches
_____ Water-Stained Leaves
_____ Local Soil Survey Data
_X_ FAC-Neutral Test
_____ Other (Explain in Remarks)

Remarks:
Water was draining into pit to a depth of 5.5" as a result of rain within 48 hours;
<2% oxidized root channels;
adjacent to monitoring well #3.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

SOILS

Map Unit Name (Series and Phase): Chewacla variant

Drainage Class: Poorly Drained

Taxonomy (Subgroup): Fluvaquentic Dystrudepts

Field Observations
Confirm Mapped Type? Yes **No**

Profile Description:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-8		10YR 4/3			l, 1fgr
8-11		10YR 4/3	6/5BG	f1d	l, 1msbk
			10YR 4/2	f1f	
11-14		10YR 4/2	10YR 3/6	f1f	l, 1msbk
			10YR 4/3	c2f	
			10YR 4/6	c2d	
			10YR 3/4	f1f	

Hydric Soil Indicators:

_____ Histosol	_____ Concretions
_____ Histic Epipedon	_____ High Organic Content in Surface Layer in Sandy Soils
_____ Sulfidic Ordor	_____ Organic Streaking in Sandy Soils
__X__ Aquic Moisture Regime	__X__ Listed on Local Hydric Soils List
_____ Reducing Conditions	__X__ Listed on National Hydric Soils List
__X__ Gleyed or Low-Chroma Colors	_____ Other (Explain in Remarks)

Remarks:
10YR 4/2 dries to 10YR 4/3 in 8-11" horizon which shows hydric soils formation;
high concentrations of mica in B horizon;
many fine and medium root throughout sample.

WETLAND DETERMINATION

Hydrophytic Vegetation Present	**Yes**	No (circle)		(circle)
Wetland Hydrology Present?	**Yes**	No		
Hydric Soils Present?	**Yes**	No	Is this Sampling Point Within a Wetland?	**Yes** No

Remarks:
Soil is becoming hydric as shown by the gleyed and low chroma colors in the 8-11" horizon.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project Site:	New Light Creek Wetland Mitigation Site			Date:	12/15/03
Applicant/Owner:	NCDOT			County:	Wake
Investigator:	S. Stokes, M. Schlegel			State:	NC
Do Normal Circumstances exist on the site?		**Yes**	No	Community ID:	
Is the site significantly disturbed (Atypical Situation)?		Yes	**No**	Transect ID:	
Is there area a potential Problem Area? (if needed, explain on reverse.)		Yes	**No**	Plot ID:	Data Point 4 (nonwetland)

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1.	*Quercus phellos*	2	FACW-	9.			
2.	*Quercus michauxii*	2	FACW-	10.			
3.	*Quercus lyrata*	2	OBL	11.			
4.	*Phytolacca americana*	2	FACU+	12.			
5.	*Festuca spp.*	3	FAC-	13.			
6.				14.			
7.				15.			
8.				16.			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 60 %

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ___ Stream, Lake or Tide Gauge
- ___ Aerial Photographs
- ___ Other

_X_ No Recorded Data Available

Field Observations: _____ (in.)

Depth of Surface Water _____ (in.)

Depth to Free Water in Pit: 14 (in.)

Depth to Saturated Soil: _____ (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- _____ Inundated
- _____ Saturated in Upper 12 Inches
- _____ Water Marks
- _____ Drift Lines
- _____ Sediment Deposits
- _____ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- _____ Oxidized Root Channels in Upper Inches
- _____ Water-Stained Leaves
- _____ Local Soil Survey Data
- _X_ FAC-Neutral Test
- _____ Other (Explain in Remarks)

Remarks:
Rained within 48 hours.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

SOILS

Map Unit Name (Series and Phase): Chewacla variant

Drainage Class: Somewhat Poorly

Taxonomy (Subgroup): Fluvaquentic Dystrudepts

Field Observations
Confirm Mapped Type? Yes **No**

Profile Description:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-6	A	10YR 4/3			l, 1fgr
6-14.5	Bw1	10YR 4/4			l, 1msbk

Hydric Soil Indicators:

_____ Histosol
_____ Histic Epipedon
_____ Sulfidic Ordor
_____ Aquic Moisture Regime
_____ Reducing Conditions
_____ Gleyed or Low-Chroma Colors
_____ Concretions
_____ High Organic Content in Surface Layer in Sandy Soils
_____ Organic Streaking in Sandy Soils
__X__ Listed on Local Hydric Soils List
__X__ Listed on National Hydric Soils List
_____ Other (Explain in Remarks)

Remarks:
Many fine roots in the A horizon;
few fine roots in the B horizon.

WETLAND DETERMINATION

Hydrophytic Vegetation Present	**Yes**	No (circle)		(circle)
Wetland Hydrology Present?	Yes	**No**		
Hydric Soils Present?	Yes	**No**	Is this Sampling Point Within a Wetland?	Yes **No**

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project Site:	New Light Creek Wetland Mitigation Site			Date:	12/15/03
Applicant/Owner:	NCDOT			County:	Wake
Investigator:	S. Stokes, M. Schlegel			State:	NC
Do Normal Circumstances exist on the site?		**Yes**	No	Community ID:	
Is the site significantly disturbed (Atypical Situation)?		Yes	**No**	Transect ID:	
Is there area a potential Problem Area? (if needed, explain on reverse.)		Yes	**No**	Plot ID:	Data Point 5 (nonwetland)

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1.	*Quercus lyrata*	2	OBL	9.			
2.	*Fraxinus pennsylvanica*	2	FACW	10.			
3.	*Festuca spp.*	3	FAC-	11.			
4.				12.			
5.				13.			
6.				14.			
7.				15.			
8.				16.			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 67 %

Remarks:

HYDROLOGY

_X_ Recorded Data (Describe in Remarks):
___ Stream, Lake or Tide Gauge
___ Aerial Photographs
_X_ Other
___ No Recorded Data Available

Field Observations: _____ (in.)

Depth of Surface Water _____ (in.)

Depth to Free Water in Pit: 14 (in.)

Depth to Saturated Soil: _____ (in.)

Wetland Hydrology Indicators:

Primary Indicators:
_____ Inundated
_____ Saturated in Upper 12 Inches
_____ Water Marks
_____ Drift Lines
_____ Sediment Deposits
_____ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
_____ Oxidized Root Channels in Upper Inches
_____ Water-Stained Leaves
_____ Local Soil Survey Data
__X__ FAC-Neutral Test
__X__ Other (Explain in Remarks)

Remarks:
Water table in the pit rose to a depth of 4" as a result of rain within 48 hours; adjacent to monitoring well #8.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

SOILS

Map Unit Name (Series and Phase): Chewacla variant

Drainage Class: Somewhat Poorly

Taxonomy (Subgroup): Fluvaquentic Dystrudepts

Field Observations Confirm Mapped Type? Yes **No**

Profile Description:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-3	A1	10YR 4/3	10YR 4/2	f2f	l, 1fgr
3-6	A2	10YR 4/3			l, 1fgr
6-10	Bw1	10YR 4/4			l, 1fsbk
10-12	Bw2	10YR 4/4	10 YR 4/3	c2f	sil, 1msbk
12-13.5	Bw3		10YR 4/4		l, 1fsbk
			10YR 4/2		
			10YR 2/2		
13.5-14	Bw4	10YR 5/4			cl, 1fsbk

Hydric Soil Indicators:

_____ Histosol
_____ Histic Epipedon
_____ Sulfidic Odor
_____ Aquic Moisture Regime
_____ Reducing Conditions
_____ Gleyed or Low-Chroma Colors
_____ Concretions
_____ High Organic Content in Surface Layer in Sandy Soils
_____ Organic Streaking in Sandy Soils
__X__ Listed on Local Hydric Soils List
__X__ Listed on National Hydric Soils List
_____ Other (Explain in Remarks)

Remarks:
Black manganese stains in 10-12” horizon and many common 10-15mm concretions at 13” indicate transition to a wetter soil;
high concentrations of mica in 12-13.5” horizon.

WETLAND DETERMINATION

Hydrophytic Vegetation Present	**Yes**	No (circle)	(circle)	
Wetland Hydrology Present?	**Yes**	No		
Hydric Soils Present?	**Yes**	No	Is this Sampling Point Within a Wetland?	**Yes** No

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project Site:	New Light Creek Wetland Mitigation Site			Date:	12/15/03
Applicant/Owner:	NCDOT			County:	Wake
Investigator:	S. Stokes, M. Schlegel			State:	NC
Do Normal Circumstances exist on the site?		**Yes**	No	Community ID:	
Is the site significantly disturbed (Atypical Situation)?		Yes	**No**	Transect ID:	
Is there area a potential Problem Area? (if needed, explain on reverse.)		Yes	**No**	Plot ID:	Data Point 6 (wetland)

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1.	*Quercus lyrata*	2	OBL	9.			
2.	*Festuca spp.*	3	FAC-	10.			
3.				11.			
4.				12.			
5.				13.			
6.				14.			
7.				15.			
8.				16.			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 50 %

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ___ Stream, Lake or Tide Gauge
- ___ Aerial Photographs
- ___ Other

_X_ No Recorded Data Available

Field Observations: _____ (in.)

Depth of Surface Water _____ (in.)

Depth to Free Water in Pit: __10__ (in.)

Depth to Saturated Soil: _____ (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- _____ Inundated
- __X__ Saturated in Upper 12 Inches
- _____ Water Marks
- _____ Drift Lines
- _____ Sediment Deposits
- _____ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- _____ Oxidized Root Channels in Upper Inches
- _____ Water-Stained Leaves
- _____ Local Soil Survey Data
- __X__ FAC-Neutral Test
- _____ Other (Explain in Remarks)

Remarks:
Water was draining into pit to a depth of 4" as a result of rain within 48 hours.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

SOILS

Map Unit Name (Series and Phase): Chewacla variant

Drainage Class: Poorly Drained

Taxonomy (Subgroup): Fluvaquentic Dystrudepts

Field Observations Confirm Mapped Type? Yes **No**

Profile Description:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-6	A	10YR 4/3			l, 1mgr
6-11	Bw1	10YR 4/3	5/N	f1p	l, 1msbk
11-13.5	Bw2	10YR 4/4	5/N	c2d	cl, 2csbk
			10YR 2/2		
13.5-14.5	Bwg3	10YR 4/2	10YR 4/4	f1f	cl, 2msbk
14.5-18	Bwg4	10YR 5/2	10YR 4/6	c2d	cl-c, 1msbk-mass
			5/N		

Hydric Soil Indicators:

_____ Histosol	_____ Concretions
_____ Histic Epipedon	_____ High Organic Content in Surface Layer in Sandy Soils
_____ Sulfidic Ordor	_____ Organic Streaking in Sandy Soils
__X__ Aquic Moisture Regime	__X__ Listed on Local Hydric Soils List
_____ Reducing Conditions	__X__ Listed on National Hydric Soils List
__X__ Gleyed or Low-Chroma Colors	_____ Other (Explain in Remarks)

Remarks:
10YR 2/2 manganese masses in 11-13.5" horizon;
many fine roots throughout sample;
3-5mm concretions in 14.5-18" horizon.

WETLAND DETERMINATION

Hydrophytic Vegetation Present	**Yes**	No (circle)		(circle)
Wetland Hydrology Present?	**Yes**	No		
Hydric Soils Present?	**Yes**	No	Is this Sampling Point Within a Wetland?	**Yes** No

Remarks:
Soil is becoming hydric as shown by the gleyed colors in the 6-11" and 11-13.5" horizons;
redox features are also present in the 11-13.5" horizon as shown by the 10YR 2/2 masses.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project Site:	New Light Creek Wetland Mitigation Site			Date:	12/15/03
Applicant/Owner:	NCDOT			County:	Wake
Investigator:	S. Stokes, M. Schlegel			State:	NC
Do Normal Circumstances exist on the site?		**Yes**	No	Community ID:	
Is the site significantly disturbed (Atypical Situation)?		Yes	**No**	Transect ID:	
Is there area a potential Problem Area? (if needed, explain on reverse.)		Yes	**No**	Plot ID:	Data Point 7 (wetland)

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1.	*Typha spp.*	3	OBL	9.			
2.	*Polygonum spp.*	3	-	10.			
3.				11.			
4.				12.			
5.				13.			
6.				14.			
7.				15.			
8.				16.			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 100 %

Remarks:

HYDROLOGY

_X_ Recorded Data (Describe in Remarks):
- ___ Stream, Lake or Tide Gauge
- ___ Aerial Photographs
- _X_ Other

___ No Recorded Data Available

Field Observations: _____ (in.)

Depth of Surface Water 1-2 (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil: _____ (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- _X_ Inundated
- _X_ Saturated in Upper 12 Inches
- _____ Water Marks
- _____ Drift Lines
- _____ Sediment Deposits
- _____ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- _X_ Oxidized Root Channels in Upper Inches
- _____ Water-Stained Leaves
- _____ Local Soil Survey Data
- _X_ FAC-Neutral Test
- _____ Other (Explain in Remarks)

Remarks:
Adjacent to monitoring well #5.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

SOILS

Map Unit Name (Series and Phase): Wehadkee

Drainage Class: Poorly Drained

Taxonomy (Subgroup): Fluvaquentic Endoaquepts

Field Observations
Confirm Mapped Type? Yes **No**

Profile Description:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-3	A	10YR 4/1			sil, mass
3-6	Bg1	2.5YR 5/2	10YR 3/6	c2d	l, mass
6-12	Bg2	10YR 4/1	5/N	f1d	c, 1msbk-mass

Hydric Soil Indicators:

_____ Histosol	_____ Concretions
_____ Histic Epipedon	_____ High Organic Content in Surface Layer in Sandy Soils
_____ Sulfidic Ordor	_____ Organic Streaking in Sandy Soils
__X__ Aquic Moisture Regime	__X__ Listed on Local Hydric Soils List
_____ Reducing Conditions	__X__ Listed on National Hydric Soils List
__X__ Gleyed or Low-Chroma Colors	_____ Other (Explain in Remarks)

Remarks:
10YR 3/6 redox concentrations in pore spaces and oxidized root channels in 3-6" horizon;
sampling point was inundated and soil structure was indistinct.

WETLAND DETERMINATION

Hydrophytic Vegetation Present	**Yes**	No (circle)		(circle)
Wetland Hydrology Present?	**Yes**	No		
Hydric Soils Present?	**Yes**	No	Is this Sampling Point Within a Wetland?	**Yes** No

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project Site:	New Light Creek Wetland Mitigation Site			Date:	12/15/03
Applicant/Owner:	NCDOT			County:	Wake
Investigator:	S. Stokes, M. Schlegel			State:	NC
Do Normal Circumstances exist on the site?		**Yes**	No	Community ID:	
Is the site significantly disturbed (Atypical Situation)?		Yes	**No**	Transect ID:	
Is there area a potential Problem Area? (if needed, explain on reverse.)		Yes	**No**	Plot ID:	Data Point 8 (nonwetland)

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1.	*Quercus lyrata*	2	OBL	9.			
2.	*Fraxinus pennsylvanica*	2	FACW	10.			
3.	*Festuca spp.*	3	FAC-	11.			
4.	*Mentha spp.*	3	-	12.			
5.				13.			
6.				14.			
7.				15.			
8.				16.			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 67 %

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ___ Stream, Lake or Tide Gauge
- ___ Aerial Photographs
- ___ Other

_X_ No Recorded Data Available

Field Observations: _____ (in.)

Depth of Surface Water _____ (in.)

Depth to Free Water in Pit: >18 (in.)

Depth to Saturated Soil: _____ (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- _____ Inundated
- _____ Saturated in Upper 12 Inches
- _____ Water Marks
- _____ Drift Lines
- _____ Sediment Deposits
- _____ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- _____ Oxidized Root Channels in Upper Inches
- _____ Water-Stained Leaves
- _____ Local Soil Survey Data
- __X__ FAC-Neutral Test
- _____ Other (Explain in Remarks)

Remarks:
Water table >18".

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

SOILS

Map Unit Name (Series and Phase): Chewacla variant

Drainage Class: Moderately well

Taxonomy (Subgroup): Fluvaquentic Dystrudepts

Field Observations
Confirm Mapped Type? Yes **No**

Profile Description:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-6	A	10YR 4/3			sl, 1mgr
6-9	Bw1	10YR 4/4			sl-l, 1msbk
9-13	Bw2	10YR 5/4	10YR 4/4	f1f	cl, 2msbk
			10YR 3/4	c2f	
13-18	Bw3	10YR 5/6	5YR 4/6	f1p	cl, 2msbk

Hydric Soil Indicators:

_____ Histosol
_____ Histic Epipedon
_____ Sulfidic Ordor
_____ Aquic Moisture Regime
_____ Reducing Conditions
_____ Gleyed or Low-Chroma Colors
_____ Concretions
_____ High Organic Content in Surface Layer in Sandy Soils
_____ Organic Streaking in Sandy Soils
__X__ Listed on Local Hydric Soils List
__X__ Listed on National Hydric Soils List
_____ Other (Explain in Remarks)

Remarks:
10YR 3/4 manganese masses in 9-13" horizon.

WETLAND DETERMINATION

Hydrophytic Vegetation Present **Yes** No (circle)
Wetland Hydrology Present? Yes **No**
Hydric Soils Present? Yes **No**

(circle)
Is this Sampling Point Within a Wetland? Yes **No**

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

Project Site:	New Light Creek Wetland Mitigation Site			Date:	12/15/03
Applicant/Owner:	NCDOT			County:	Wake
Investigator:	S. Stokes, M. Schlegel			State:	NC
Do Normal Circumstances exist on the site?		**Yes**	No	Community ID:	
Is the site significantly disturbed (Atypical Situation)?		Yes	**No**	Transect ID:	
Is there area a potential Problem Area? (if needed, explain on reverse.)		Yes	**No**	Plot ID:	Data Point 9 (nonwetland) At monitoring well #4

VEGETATION

Dominant Plant Species		Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1.	*Festuca spp.*	3	FAC-	9.			
2.				10.			
3.				11.			
4.				12.			
5.				13.			
6.				14.			
7.				15.			
8.				16.			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 0 %

Remarks:

HYDROLOGY

_X_ Recorded Data (Describe in Remarks):
___ Stream, Lake or Tide Gauge
___ Aerial Photographs
_X_ Other
___ No Recorded Data Available

Field Observations: _____ (in.)

Depth of Surface Water _____ (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil: _____ (in.)

Wetland Hydrology Indicators:

Primary Indicators:
_____ Inundated
_____ Saturated in Upper 12 Inches
_____ Water Marks
_____ Drift Lines
_____ Sediment Deposits
_____ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
_____ Oxidized Root Channels in Upper Inches
_____ Water-Stained Leaves
_____ Local Soil Survey Data
_____ FAC-Neutral Test
_____ Other (Explain in Remarks)

Remarks:
No indications of wetland hydrology;
adjacent to monitoring well #4.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLANDS DELINEATION MANUAL)

SOILS

Map Unit Name (Series and Phase): Chewacla variant

Drainage Class: Somewhat Poorly

Taxonomy (Subgroup): Fluvaquentic Dystrudepts

Field Observations
Confirm Mapped Type? Yes **No**

Profile Description:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-6	A	10YR 4/3			l, 1fgr
6-13	Bt1	10YR 4/4			scl, 1fsbk

Hydric Soil Indicators:

_____ Histosol
_____ Histic Epipedon
_____ Sulfidic Ordor
_____ Aquic Moisture Regime
_____ Reducing Conditions
_____ Gleyed or Low-Chroma Colors
_____ Concretions
_____ High Organic Content in Surface Layer in Sandy Soils
_____ Organic Streaking in Sandy Soils
__X__ Listed on Local Hydric Soils List
__X__ Listed on National Hydric Soils List
_____ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present	Yes	**No**	(circle)
Wetland Hydrology Present?	Yes	**No**	
Hydric Soils Present?	Yes	**No**	

(circle)
Is this Sampling Point Within a Wetland? Yes **No**

Remarks:

KCI

SOIL PROFILE DESCRIPTION

Client:	NCDOT	Date:	12/3/2003
Project:	New Light Creek Wetland Mitigation Site	Project #:	1202084H - WD
County:	Wake	State:	NC
Location:	NE of Mangum Dairy Rd, adacent to New Light Creek	Site/Lot:	Data Point 1
Soil Series:	Wehadkee variant		
Soil Classification:	Fine-loamy, mixed, active, nonacid, thermic Fluvaquentic Endoaquepts		
AWT: 11.5	SHWT: 4-8	Slope: 0-1	Aspect:
Elevation:	Drainage: Poor	Permeability:	moderate
Vegetation:	Mixed bottomland hardwoods		

Borings terminated at 50 Inches

HORIZON	DEPTH (IN)	MATRIX	MOTTLES	TEXTURE	STRUCTURE	CONSISTENCE	BOUNDARY	NOTES
A	0-4	10YR 5/3		l	1fgr	mfr	cs	
Bw	4-8	10YR 5/3	10YR 5/2 f1f	scl	1msbk	mfr	cs	
			4/5b c2p					
Bg1	8-11	10YR 5/2	10YR 4/4 f1f	scl	1msbk	mfr	cs	
			5YR 4/6 f1f					in pore spaces
Bg2	11-16	10YR 5/2	5YR 4/6 c2p	scl	1fsbk	mfr	cs	
Bg3	16-27	10YR 5/2	5YR 4/6 c2p	scl	2fsbk	mfr	gw	
C1	27-30	10YR 4/1		s	sg	l		
C2	30-50	5/10y	5YR 4/6 c2p	sl	mass	mfr		

COMMENTS:

DESCRIBED BY: S. Stokes DATE: 12/3/03

KCI

SOIL PROFILE DESCRIPTION

Client: NCDOT Date: 12/3/2003

Project: New Light Creek Wetland Mitigation Site Project #: 1202084H - WD

County: Wake State: NC

Location: NE of Mangum Dairy Rd, adacent to New Light Creek Site/Lot: Data Point 2

Soil Series: Chewacla

Soil Classification: Fine-loamy, mixed, active, thermic Fluvaquentic Dystrudepts

AWT: 16 SHWT: 12.5 Slope: 0-1 Aspect:

Elevation: Drainage: Somewhat Poorly Permeability: moderate

Vegetation: Mixed hardwoods and pine with Fescue ground cover

Borings terminated at 55 Inches

HORIZON	DEPTH (IN)	MATRIX	MOTTLES	TEXTURE	STRUCTURE	CONSISTENCE	BOUNDARY	NOTES
A	0-9.5	10YR 4/3		sl	1mgr	mfr	cs	
Bw1	9.5-12.5	10YR 4/3	5YR 4/6 c2p	scl	1fsbk	mfr	cs	
Bw2	12.5-14	10YR 4/3	5YR 4/6 c2p	scl	1msbk	mfr	cw	
			10YR 5/2 c2f					
Bw3	14-32	10YR 5/2	5YR 4/6 c2p	sl	1fsbk	mfr	gw	
C1	32-40	5/10Y	5YR 4/6 c2p	scl	mass	mfr	gw	
C1	40-55		5/10Y	sc	mass	mfr		
			10YR 5/6					
			10YR 5/2					

LICENSED SOIL SCIENTIST
STEVEN F. STOKES
1087
STATE OF NORTH CAROLINA

COMMENTS:

DESCRIBED BY: S. Stokes DATE: 12/3/03